

at least one ion exchange resin filling said microstructure such that said composite membrane is air impermeable, said composite membrane having a thickness of at most 0.8 mils and an ionic [conductance] conduction rate of at least 5.1 μ mhos/min.

2 100. (once amended) The composite membrane of claim [100] 99, wherein said polymeric support is a polyolefin.

3 101. (once amended) The composite membrane of claim [100] 99, wherein said polymeric support is a fluorinated polymer.

8 102. (once amended) The composite membrane of claim [100] 99, wherein said polymeric support is a chlorinated polymer.

4 103. (once amended) The composite membrane of claim [102] 101, wherein said fluorinated polymer is polytetrafluoroethylene.

5 104. (once amended) The composite membrane of claim [104] 103, wherein said polytetrafluoroethylene is expanded polytetrafluoroethylene.

9 105. (once amended) The composite membrane of claim [100] 99, wherein said polymeric support is a polyamide.

10 106. (once amended) The composite membrane of claim [100] 99, wherein said polymeric support is a polycarbonate.

7 107. (once amended) The composite membrane of claim [102] 101, wherein said microstructure includes nodes interconnected with fibrils. ³

6 108. (once amended) The composite membrane of claim [104] 103, wherein said microstructure includes nodes interconnected with fibrils. ⁴

11 109. (once amended) The composite membrane of claim [100] 99, wherein the thickness of said composite membrane is in the range of between 0.06 and 0.8 mils.

16 110. (once amended) The composite membrane of claim [100] 99, wherein the thickness of said composite membrane is in the range of between about 0.5 and 0.8 mils.

17 111. (once amended) The composite membrane of claim [100] 99, wherein the thickness

of said composite membrane is at most 0.5 mils.

18 ~~12~~. (once amended) The composite membrane of claim [100] ~~99~~, wherein said at least one ion exchange resin comprises a mixture of ion exchange resins.

20 ~~13~~. (once amended) The composite membrane of claim [100] ~~99~~, wherein said at least one ion exchange resin comprises a perfluorinated sulfonic acid resin.

21 ~~14~~. (once amended) The composite membrane of claim [100] ~~99~~, wherein said at least one ion exchange resin comprises a perfluorinated carboxylic acid resin.

22 ~~15~~. (once amended) The composite membrane of claim [100] ~~99~~, wherein said at least one ion exchange resin comprises a polyvinyl alcohol.

23 ~~16~~. (once amended) The composite membrane of claim [100] ~~99~~, wherein said at least one ion exchange resin comprises a divinyl benzene resin.

24 ~~17~~. (once amended) The composite membrane of claim [100] ~~99~~, wherein said at least one ion exchange resin comprises a styrene-based polymer.

25 18. (once amended) The composite membrane of claim [100]¹99, wherein said at least one ion exchange resin further comprises metal salts with or without a polymer.

19 19. (once amended) The composite membrane of claim [113]¹12, wherein said mixture of ion exchange resins includes at least two of a perfluorinated sulfonic acid resin, a perfluorinated carboxylic acid resin, a polyvinyl alcohol resin, a divinyl benzene resin or a styrene-based polymer.

26 120. (once amended) The composite membrane of claim [100]¹99, wherein said at least one ion exchange resin is a perfluorosulfonic acid/tetrafluoroethylene copolymer resin.

27 121. (once amended) The composite membrane of claim [100]¹99, further comprising a reinforcement backing bonded to a side thereof.

35 122. (once amended) An [integral] substantially air occlusive integral composite membrane having a polymeric support with a microstructure of pores, said microstructure filled with an ion exchange resin, said composite membrane has an ionic [conductance] conduction rate of at least 5.1 μ mhos/min, said composite membrane prepared by,

(a) providing a polymeric support having a microstructure of micropores;

(b) [sequentially] applying an ion exchange resin solution to [each major surface of] said polymeric support; and

(c) repeating step (b) until said micropores are sufficiently filled with ion exchange resin to form an air occlusive integral composite membrane.

36 ~~123~~. (once amended) The composite membrane of claim [123] ~~122~~, wherein said step (b) further includes,

(b1) drying said support after each application of ion exchange resin solution to remove solvent from said solution.

38 ~~124~~. (once amended) The composite membrane of claim [123] ~~122~~, wherein said step (b) includes at least three successive applications of said ion exchange resin solution.

39 ~~125~~. (once amended) The composite membrane of claim [123] ~~122~~, wherein said step (b) includes at least four successive applications of said ion exchange resin solution.

40 ~~126~~. (once amended) The composite membrane of claim [123] ~~122~~, wherein said step (b) includes at least three successive applications of said ion exchange resin solution, each followed by a drying step.

42 ³⁵ 127. (once amended) The composite membrane of claim [123] 122, wherein said step (b) includes at least four successive applications of said ion exchange resin solution, each followed by a drying step.

43 ³⁵ 128. (once amended) The composite membrane of claim [123] 122, wherein said support comprises a polyolefin.

44 ³⁵ 129. (once amended) The composite membrane of claim [123] 122, wherein said support comprises a fluorinated polymer.

45 ³⁵ 130. (once amended) The composite membrane of claim [123] 122, wherein said support comprises a chlorinated polymer.

45 ⁴⁴ 131. (once amended) The composite membrane of claim [130] 129, wherein said fluorinated polymer is polytetrafluoroethylene.

46 ⁴⁵ 132. (once amended) The composite membrane of claim [132] 131, wherein said polytetrafluoroethylene is expanded polytetrafluoroethylene.

~~49~~ 133. (once amended) The composite membrane of claim [123] ~~122~~, wherein said support comprises a polyamide.

~~50~~ 134. (once amended) The composite membrane of claim [123] ~~122~~, wherein said support comprises a polycarbonate.

~~47~~ 135. (once amended) The composite membrane of claim [130] ~~129~~, where said microstructure includes nodes interconnected with fibrils.

~~51~~ 136. (once amended) The composite membrane of claim [123] ~~122~~, having a thickness in the range between 0.06 and 0.8 mils.

~~52~~ 137. (once amended) The composite membrane of claim [137] ~~136~~, having a thickness in the range of between about 0.5 and at most 0.8 mils.

~~53~~ 138. (once amended) The composite membrane of claim [137] ~~136~~, having a thickness of at most about 0.5 mils.

58 139. (once amended) The composite membrane of claim [123] 122, wherein said ion exchange resin is a mixture of resins.

59 140. (once amended) The composite membrane of claim [123] 122, wherein said ion exchange resin is a perfluorinated sulfonic acid resin.

41 141. (once amended) The composite membrane of claim [127] 126, wherein said drying is conducted at about room temperature.

60 142. (once amended) The composite membrane of claim [123] 122, wherein said ion exchange resin solution is applied in the presence of a surfactant.

37 143. (once amended) The composite membrane of claim [124] 123, wherein said ion exchange resin solution is applied in the presence of a surfactant.

12 172. (once amended) The composite membrane of claim [110] 109, wherein the thickness of said composite membrane is at most 0.4 mils.

13 ¹¹ 173. (once amended) The composite membrane of claim [110] ¹¹ 109, wherein the thickness of said composite membrane is at most 0.3 mils.

14 ¹¹ 174. (once amended) The composite membrane of claim [110] ¹¹ 109, wherein the thickness of said composite membrane is at most 0.2 mils.

15 ¹¹ 175. (once amended) The composite membrane of claim [110] ¹¹ 109, wherein the thickness of said composite membrane is at most 0.1 mils.

54 ⁵¹ 176. (once amended) The composite membrane of claim [137] ⁵¹ 136, wherein the thickness of said composite membrane is at most 0.4 mils.

55 ⁵¹ 177. (once amended) The composite membrane of claim [137] ⁵¹ 136, wherein the thickness of said composite membrane is at most 0.3 mils.

56 ⁵¹ 178. (once amended) The composite membrane of claim [137] ⁵¹ 136, wherein the thickness of said composite membrane is at most 0.2 mils.

57 ⁵¹ 179. (once amended) The composite membrane of claim [137] ⁵¹ 136, wherein the

thickness of said composite membrane is at most 0.1 mils.

29 249. (once amended) An integral air impermeable composite membrane comprising:
a polymeric support having a microstructure of micropores, said microstructure defining a porosity in the range of about 70% to 98% within said support,
at least one ion exchange resin filling said microstructure such that said composite membrane is air impermeable, said composite membrane having a thickness of at most 0.8 mils.

Please cancel claims 189-248 without prejudice.

Please add new dependent claim 255:

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255. The composite membrane according to claim 29, wherein the ionic conduction rate is measured with two 900 mL compartments between which the membrane is placed, wherein the exposed surface area of the membrane is 7.07 square inches, wherein one compartment is filled with 1 M sodium chloride solution and the other compartment, the permeate compartment, is filled with pure distilled water, wherein both compartments are stirred continuously and at the same speed with two electric mixers, wherein the conductance of the permeate compartment is recorded every five minutes for an hour, and wherein the ionic